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TOXIC WATERS

Clean Water Laws Are Neglected, at a Cost in Suffering

By **CHARLES DUHIGG**

Jennifer Hall-Massey knows not to drink the tap water in her home near Charleston, W.Va.

In fact, her entire family tries to avoid any contact with the water. Her youngest son has scabs on his arms, legs and chest where the bathwater — polluted with lead, nickel and other heavy metals — caused painful rashes. Many of his brother's teeth were capped to replace enamel that was eaten away.

Neighbors apply special lotions after showering because their skin burns. Tests show that their tap water contains arsenic, barium, lead, manganese and other chemicals at concentrations federal regulators say could contribute to cancer and damage the kidneys and nervous system.

"How can we get digital cable and Internet in our homes, but not clean water?" said Mrs. Hall-Massey, a senior accountant at one of the state's largest banks.

She and her husband, Charles, do not live in some remote corner of Appalachia. Charleston, the state capital, is less than 17 miles from her home.

"How is this still happening today?" she asked.

When Mrs. Hall-Massey and 264 neighbors sued nine nearby coal companies, accusing them of putting dangerous waste into local water supplies, their lawyer did not have to look far for evidence. As required by state law, some of the companies had disclosed in reports to regulators that they were pumping into the ground illegal concentrations of chemicals — the same pollutants that flowed from residents' taps.

But state regulators never fined or punished those companies for breaking those pollution laws.

This pattern is not limited to West Virginia. Almost four decades ago, Congress passed the Clean Water Act to force polluters to disclose the toxins they dump into waterways and to give regulators the power to fine or jail offenders. States have passed pollution statutes of their own.

But in recent years, violations of the Clean Water Act have risen steadily across the nation, an extensive review of water pollution records by The New York Times found.

In the last five years alone, chemical factories, manufacturing plants and other workplaces have violated water pollution laws more than half a million times. The violations range from failing to report emissions to dumping toxins at concentrations regulators say might contribute to cancer, birth defects and other illnesses.

However, the vast majority of those polluters have escaped punishment. State officials have repeatedly ignored obvious illegal dumping, and the [Environmental Protection Agency](#), which can prosecute polluters when states fail to act, has often declined to intervene.

Because it is difficult to determine what causes diseases like cancer, it is impossible to know how many illnesses are the result of water pollution, or contaminants' role in the health problems of specific individuals.

But concerns over these toxins are great enough that Congress and the E.P.A. regulate more than 100 pollutants through the Clean Water Act and strictly limit 91 chemicals or contaminants in tap water through the Safe Drinking Water Act.

Regulators themselves acknowledge lapses. The new E.P.A. administrator, [Lisa P. Jackson](#), said in an interview that despite many successes since the Clean Water Act was passed in 1972, today the nation's water does not meet public health goals, and enforcement of water pollution laws is unacceptably low. She added that strengthening water protections is among her top priorities. State regulators say they are doing their best with insufficient resources.

The Times obtained hundreds of thousands of water pollution records through Freedom of Information Act requests to every state and the E.P.A., and compiled [a national database of water pollution violations](#) that is more comprehensive than those maintained by states or the E.P.A. (For an interactive version, which can show violations in any community, visit www.nytimes.com/toxicwaters.)

In addition, The Times interviewed more than 250 state and federal regulators, water-system managers, environmental advocates and scientists.

That research shows that an estimated one in 10 Americans have been exposed to drinking water that contains dangerous chemicals or fails to meet a federal health benchmark in other ways.

Those exposures include carcinogens in the tap water of major American cities and unsafe chemicals in drinking-water wells. Wells, which are not typically regulated by the Safe Drinking Water Act, are more likely to contain contaminants than municipal water systems.

Because most of today's water pollution has no scent or taste, many people who consume dangerous chemicals do not realize it, even after they become sick, researchers say.

But an estimated 19.5 million Americans fall ill each year from drinking water contaminated with parasites, bacteria or viruses, according to a study published last year in the scientific journal *Reviews of Environmental Contamination and Toxicology*. That figure does not include illnesses caused by other chemicals and toxins.

In the nation's largest dairy states, like Wisconsin and California, farmers have sprayed liquefied animal feces onto fields, where it has seeped into wells, causing severe infections. Tap water in parts of the Farm Belt, including cities in Illinois, Kansas, Missouri and Indiana, has contained pesticides at concentrations that some scientists have linked to birth defects and fertility problems.

In parts of New York, Rhode Island, Ohio, California and other states where sewer systems cannot accommodate heavy rains, untreated human waste has flowed into rivers and washed onto beaches. Drinking water in parts of New Jersey, New York, Arizona and Massachusetts shows some of the highest concentrations of tetrachloroethylene, a dry cleaning solvent that has been linked to kidney damage and cancer. (Specific types of water pollution across the United States will be examined in future Times articles.)

The Times's research also shows that last year, 40 percent of the nation's community water systems violated the Safe Drinking Water Act at least once, according to an analysis of E.P.A. data. Those violations ranged from failing to maintain proper paperwork to allowing carcinogens into tap water. More than 23 million people received drinking water from municipal systems that violated a health-based standard.

In some cases, people got sick right away. In other situations, pollutants like chemicals, inorganic toxins and heavy metals can accumulate in the body for years or decades before they cause problems. Some of the most frequently detected contaminants have been linked to cancer, birth defects and neurological disorders.

Records analyzed by The Times indicate that the Clean Water Act has been violated more than 506,000 times since 2004, by more than 23,000 companies and other facilities, according to reports submitted by polluters themselves. Companies sometimes test what they are dumping only once a quarter, so the actual number of days when they broke the law is often far higher. And some companies illegally avoid reporting their emissions, say officials, so infractions go unrecorded.

Environmental groups say the number of Clean Water Act violations has increased significantly in the last decade. Comprehensive data go back only five years but show that the number of facilities violating the Clean Water Act grew more than 16 percent from 2004 to 2007, the most recent year with complete data.

Polluters include small companies, like gas stations, dry cleaners, shopping malls and the Friendly Acres Mobile Home Park in Laporte, Ind., which acknowledged to regulators that it had dumped human waste into a nearby river for three years.

They also include large operations, like chemical factories, power plants, sewage treatment centers and one of the biggest zinc smelters, the Horsehead Corporation of Pennsylvania, which has dumped illegal concentrations of copper, lead, zinc, chlorine and selenium into the Ohio River. Those chemicals can contribute to mental retardation and cancer.

Some violations are relatively minor. But about 60 percent of the polluters were deemed in “significant noncompliance” — meaning their violations were the most serious kind, like dumping cancer-causing chemicals or failing to measure or report when they pollute.

Finally, the Times’s research shows that fewer than 3 percent of Clean Water Act violations resulted in fines or other significant punishments by state officials. And the E.P.A. has often declined to prosecute polluters or force states to strengthen their enforcement by threatening to withhold federal money or take away powers the agency has delegated to state officials.

Neither Friendly Acres Mobile Home Park nor Horsehead, for instance, was fined for Clean Water Act violations in the last eight years. A representative of Friendly Acres declined to comment. Indiana officials say they are investigating the mobile home park. A representative of Horsehead said the company had taken steps to control pollution and was negotiating with regulators to clean up its emissions.

Numerous state and federal lawmakers said they were unaware that pollution was so widespread.

“I don’t think anyone realized how bad things have become,” said Representative [James L. Oberstar](#), a Minnesota Democrat, when told of The Times’s findings. Mr. Oberstar is chairman of the House Transportation and Infrastructure Committee, which has jurisdiction over many water-quality issues.

“The E.P.A. and states have completely dropped the ball,” he said. “Without oversight and enforcement, companies will use our lakes and rivers as dumping grounds — and that’s exactly what is apparently going on.”

The E.P.A. administrator, Ms. Jackson, whose appointment was confirmed in January, said in an interview that she intended to strengthen enforcement of the Clean Water Act and pressure states to apply the law.

“I’ve been saying since Day One I want to work on these water issues pretty broadly across the country,” she said. On Friday, the E.P.A. said that it was reviewing dozens of coal-mining permits in West Virginia and three other states to make sure they would not violate the Clean Water Act.

After E.P.A. officials received detailed questions from The New York Times in June, Ms. Jackson sent [a memo](#) to her enforcement deputy noting that the E.P.A. is “falling short of this administration’s expectations for the effectiveness of our clean water enforcement programs. Data available to E.P.A. shows that, in many parts of the country, the level of significant noncompliance with permitting requirements is unacceptably high and the level of enforcement activity is unacceptably low.”

State officials, for their part, attribute rising pollution rates to increased workloads and dwindling resources. In 46 states, local regulators have primary responsibility for crucial aspects of the Clean Water Act. Though the number of regulated facilities has more than doubled in the last 10 years, many state enforcement budgets have remained essentially flat when adjusted for inflation. In New York, for example, the number of regulated polluters has almost doubled to 19,000 in the last decade, but the number of inspections each year has remained about the same.

But stretched resources are only part of the reason polluters escape punishment. The Times’s investigation shows that in West Virginia and other states, powerful industries have often successfully lobbied to undermine effective regulation.

State officials also argue that water pollution statistics include minor infractions, like failing to file reports, which do not pose risks to human health, and that records collected by The Times failed to examine informal enforcement methods, like sending warning letters.

“We work enormously hard inspecting our coal mines, analyzing water samples, notifying companies of violations when we detect them,” said Randy Huffman, head of West Virginia’s Department of Environmental Protection. “When I look at how far we’ve come in protecting the state’s waters since we took responsibility for the Clean Water Act, I think we have a lot to be proud of.”

But unchecked pollution remains a problem in many states. West Virginia offers a revealing example of why so many companies escape punishment.

One Community’s Plight

The mountains surrounding the home of Mrs. Hall-Massey’s family and West Virginia’s nearby capital have long been mined for coal. And for years, the area enjoyed clean well water.

But starting about a decade ago, awful smells began coming from local taps. The water was sometimes gray, cloudy and oily. Bathtubs and washers developed rust-colored rings that scrubbing could not remove. When Mrs. Hall-Massey’s husband installed industrial water filters, they quickly turned black. Tests showed that their water contained toxic amounts of lead, manganese, barium and other metals that can contribute to organ failure or developmental problems.

Around that time, nearby coal companies had begun pumping industrial waste into the ground.

Mining companies often wash their coal to remove impurities. The leftover liquid — a black fluid containing dissolved minerals and chemicals, known as sludge or slurry — is often disposed of in vast lagoons or through injection into abandoned mines. The liquid in those lagoons and shafts can flow through cracks in the earth into water supplies. Companies must regularly send samples of the injected liquid to labs, which provide reports that are forwarded to state regulators.

In the eight miles surrounding Mrs. Hall-Massey’s home, coal companies have injected more than 1.9 billion gallons of coal slurry and sludge into the ground since 2004, according to a review of thousands of state records. Millions more gallons have been dumped into lagoons.

These underground injections have contained chemicals at concentrations that pose serious health risks, and thousands of injections have violated state regulations and the Safe Drinking Water Act, according to reports sent to the state by companies themselves.

For instance, three coal companies — Loadout, Remington Coal and Pine Ridge, a subsidiary of [Peabody Energy](#), one of the largest coal companies in the world — reported to state officials that 93 percent of the waste they injected near this community had illegal concentrations of chemicals including arsenic, lead, chromium, beryllium or nickel.

Sometimes those concentrations exceeded legal limits by as much as 1,000 percent. Those chemicals have been shown to contribute to cancer, organ failures and other diseases.

But those companies were never fined or punished for those illegal injections, according to state records. They were never even warned that their activities had been noticed.

Remington Coal declined to comment. A representative of Loadout's parent said the company had assigned its permit to another company, which ceased injecting in 2006. Peabody Energy, which spun off Pine Ridge in 2007, said that some data sent to regulators was inaccurate and that the company's actions reflected best industry practices.

West Virginia officials, when asked about these violations, said regulators had accidentally overlooked many pollution records the companies submitted until after the statute of limitations had passed, so no action was taken. They also said their studies indicated that those injections could not have affected drinking water in the area and that other injections also had no detectable effect.

State officials noted that they had cited more than 4,200 water pollution violations at mine sites around the state since 2000, as well as conducted thousands of investigations. The state has initiated research about how mining affects water quality. After receiving questions from The Times, officials announced a statewide moratorium on issuing injection permits and told some companies that regulators were investigating their injections.

"Many of the issues you are examining are several years old, and many have been addressed," West Virginia officials wrote in a statement. The state's pollution program "has had its share of issues," regulators wrote. However, "it is important to note that if the close scrutiny given to our state had been given to others, it is likely that similar issues would have been found."

More than 350 other companies and facilities in West Virginia have also violated the Clean Water Act in recent years, records show. Those infractions include releasing illegal concentrations of iron, manganese, aluminum and other chemicals into lakes and rivers.

As the water in Mrs. Hall-Massey's community continued to worsen, residents began complaining of increased health problems. Gall bladder diseases, fertility problems, miscarriages and kidney and thyroid issues became common, according to interviews.

When Mrs. Hall-Massey's family left on vacation, her sons' rashes cleared up. When they returned, the rashes reappeared. Her dentist told her that chemicals appeared to be damaging her teeth and her son's, she said. As the quality of her water worsened, Mrs. Hall-Massey's once-healthy teeth needed many crowns. Her son brushed his teeth often, used a fluoride rinse twice a day and was not allowed to eat sweets. Even so, he continued getting cavities until the family stopped using tap water. By the time his younger brother's teeth started coming in, the family was using bottled water to brush. He has not had dental problems.

Medical professionals in the area say residents show unusually high rates of health problems. A survey of more than 100 residents conducted by a nurse hired by Mrs. Hall-Massey's lawyer indicated that as many as 30 percent of people in this area have had their gallbladders removed, and as many as half the residents have significant tooth enamel damage, chronic stomach problems and other illnesses. That research was confirmed through interviews with residents.

It is difficult to determine which companies, if any, are responsible for the contamination that made its way into tap water or to conclude which specific chemicals, if any, are responsible for particular health problems. Many coal companies say they did not pollute the area's drinking water and chose injection sites that flowed away from nearby homes.

An independent study by a university researcher challenges some of those claims.

"I don't know what else could be polluting these wells," said Ben Stout, a biology professor at Wheeling Jesuit University who tested the water in this community and elsewhere in West Virginia. "The chemicals coming out of people's taps are identical to the chemicals the coal companies are pumping into the ground."

One night, Mrs. Hall-Massey's 6-year-old son, Clay, asked to play in the tub. When he got out, his bright red rashes hurt so much he could not fall asleep. Soon, Mrs. Hall-Massey began complaining to state officials. They told her they did not know why her water was bad, she recalls,

but doubted coal companies had done anything wrong. The family put their house on the market, but because of the water, buyers were not interested.

In December, Mrs. Hall-Massey and neighbors sued in county court, seeking compensation. That suit is pending. To resolve a related lawsuit filed about the same time, the community today gets regular deliveries of clean drinking water, stored in coolers or large blue barrels outside most homes. Construction began in August on a pipeline bringing fresh water to the community.

But for now most residents still use polluted water to bathe, shower and wash dishes.

“A parent’s only real job is to protect our children,” Mrs. Hall-Massey said. “But where was the government when we needed them to protect us from this stuff?”

Regulators ‘Overwhelmed’

Matthew Crum, a 43-year-old lawyer, wanted to protect people like Mrs. Hall-Massey. That is why he joined West Virginia’s environmental protection agency in 2001, when it became clear that the state’s and nation’s streams and rivers were becoming more polluted.

But he said he quickly learned that good intentions could not compete with intimidating politicians and a fearful bureaucracy.

Mr. Crum grew up during a golden age of environmental activism. He was in elementary school when Congress passed the Clean Water Act of 1972 in response to environmental disasters, including a fire on the polluted Cuyahoga River in Cleveland. The act’s goal was to eliminate most water pollution by 1985 and prohibit the “discharge of toxic pollutants in toxic amounts.”

“There were a bunch of us that were raised with the example of the Clean Water Act as inspiration,” he said. “I wanted to be part of that fight.”

In the two decades after the act’s passage, the nation’s waters grew much healthier. The Cuyahoga River, West Virginia’s Kanawha River and hundreds of other beaches, streams and ponds were revitalized.

But in the late 1990s, some states’ enforcement of pollution laws began tapering off, according to regulators and environmentalists. Soon the E.P.A. started reporting that the nation’s rivers, lakes and estuaries were becoming dirtier again. Mr. Crum, after a stint in Washington with the Justice

Department and the birth of his first child, joined West Virginia's Department of Environmental Protection, where new leadership was committed to revitalizing the Clean Water Act.

He said his idealism was tested within two weeks, when he was called to a huge coal spill into a stream.

"I met our inspector at the spill site, and we had this really awkward conversation," Mr. Crum recalled. "I said we should shut down the mine until everything was cleaned up. The inspector agreed, but he said if he issued that order, he was scared of getting demoted or transferred to the middle of nowhere. Everyone was terrified of doing their job."

Mr. Crum temporarily shut the mine.

In the next two years, he shut many polluting mines until they changed their ways. His tough approach raised his profile around the state.

Mining companies, worried about attracting Mr. Crum's attention, began improving their waste disposal practices, executives from that period said. But they also began complaining to their friends in the state's legislature, they recalled in interviews, and started a whisper campaign accusing Mr. Crum of vendettas against particular companies — though those same executives now admit they had no evidence for those claims.

In 2003, a new director, Stephanie Timmermeyer, was nominated to run the Department of Environmental Protection. One of West Virginia's most powerful state lawmakers, Eustace Frederick, said she would be confirmed, but only if she agreed to fire Mr. Crum, according to several people who said they witnessed the conversation.

She was given the job and soon summoned Mr. Crum to her office. He was dismissed two weeks after his second child's birth.

Ms. Timmermeyer, who resigned in 2008, did not return calls. Mr. Frederick died last year.

Since then, hundreds of workplaces in West Virginia have violated pollution laws without paying fines. A half-dozen current and former employees, in interviews, said their enforcement efforts had been undermined by bureaucratic disorganization, a departmental preference to let polluters escape punishment if they promise to try harder, and a revolving door of regulators who leave for higher-paying jobs at the companies they once policed.

“We are outmanned and overwhelmed, and that’s exactly how industry wants us,” said one employee who requested anonymity for fear of being fired. “It’s been obvious for decades that we’re not on top of things, and coal companies have earned billions relying on that.”

In June, four environmental groups petitioned the E.P.A. to take over much of West Virginia’s handling of the Clean Water Act, citing a “nearly complete breakdown” in the state. The E.P.A. has asked state officials to respond and said it is investigating the petition.

Similar problems exist in other states, where critics say regulators have often turned a blind eye to polluters. Regulators in five other states, in interviews, said they had been pressured by industry-friendly politicians to drop continuing pollution investigations.

“Unless the E.P.A. is pushing state regulators, a culture of transgression and apathy sets in,” said William K. Reilly, who led the E.P.A. under President [George H. W. Bush](#).

In response, many state officials defend their efforts. A spokeswoman for West Virginia’s Department of Environmental Protection, for instance, said that between 2006 and 2008, the number of cease-operation orders issued by regulators was 10 percent higher than during Mr. Crum’s two-year tenure.

Mr. Huffman, the department’s head, said there is no political interference with current investigations. Department officials say they continue to improve the agency’s procedures, and note that regulators have assessed \$14.7 million in state fines against more than 70 mining companies since 2006.

However, that is about equal to the revenue those businesses’ parent companies collect every 10 hours, according to financial reports. (To find out about every state’s enforcement record and read comments from regulators, visit www.nytimes.com/waterdata.)

“The real test is, is our water clean?” said Mr. Huffman. “When the Clean Water Act was passed, this river that flows through our capital was very dirty. Thirty years later, it’s much cleaner because we’ve chosen priorities carefully.”

Some regulators admit that polluters have fallen through the cracks. To genuinely improve enforcement, they say, the E.P.A. needs to lead.

“If you don’t have vigorous oversight by the feds, then everything just goes limp,” said Mr. Crum. “Regulators can’t afford to have some backbone unless they know Washington or the governor’s office will back them up.”

It took Mr. Crum a while to recover from his firing. He moved to Virginia to work at the [Nature Conservancy](#), an environmental conservation group. Today, he is in private practice and works on the occasional environmental lawsuit.

“We’re moving backwards,” he said, “and it’s heartbreaking.”

Shortcomings of the E.P.A.

The memos are marked “DO NOT DISTRIBUTE.”

They were written this year by E.P.A. staff, the culmination of a five-year investigation of states’ enforcement of federal pollution laws. And in bland, bureaucratic terms, they describe a regulatory system — at the E.P.A. and among state agencies — that in many ways simply does not work.

For years, according to one memo, federal regulators knew that more than 30 states had major problems documenting which companies were violating pollution laws. Another notes that states’ “personnel lack direction, ability or training” to levy fines large enough to deter polluters.

But often, the memos say, the E.P.A. never corrected those problems even though they were widely acknowledged. The E.P.A. “may hesitate to push the states” out of “fear of risking their relationships,” one report reads. Another notes that E.P.A. offices lack “a consistent national oversight strategy.”

Some of those memos, part of an effort known as the State Review Framework, were obtained from agency employees who asked for anonymity, and others through Freedom of Information Act requests.

Enforcement lapses were particularly bad under the administration of President [George W. Bush](#), employees say. “For the last eight years, my hands have been tied,” said one E.P.A. official who requested anonymity for fear of retribution. “We were told to take our clean water and clean air cases, put them in a box, and lock it shut. Everyone knew polluters were getting away with murder. But these polluters are some of the biggest campaign contributors in town, so no one really cared if they were dumping poisons into streams.”

The E.P.A. administrators during the last eight years — [Christine Todd Whitman](#), [Michael O. Leavitt](#) and [Stephen L. Johnson](#) — all declined to comment.

When [President Obama](#) chose Ms. Jackson to head the E.P.A., many environmentalists and agency employees were encouraged. During his campaign, Mr. Obama promised to “reinvigorate the drinking water standards that have been weakened under the Bush administration and update them to address new threats.” He pledged to regulate water pollution from livestock operations and push for amendments to the Clean Water Act.

But some worry those promises will not be kept. Water issues have taken a back seat to other environmental concerns, like carbon emissions.

In an interview, Ms. Jackson noted that many of the nation’s waters were healthier today than when the Clean Water Act was passed and said she intended to enforce the law more vigorously. After receiving detailed questions from The Times, she put many of the State Review Framework documents on the agency’s Web site, and ordered more disclosure of the agency’s handling of water issues, increased enforcement and revamped technology so that facilities’ environmental records are more accessible.

“Do critics have a good and valid point when they say improvements need to be made? Absolutely,” Ms. Jackson said. “But I think we need to be careful not to do that by scaring the bejesus out of people into thinking that, boy, are things horrible. What it requires is attention, and I’m going to give it that attention.”

In statements, E.P.A. officials noted that from 2006 to 2008, the agency conducted 11,000 Clean Water Act and 21,000 Safe Drinking Water Act inspections, and referred 146 cases to the Department of Justice. During the 2007 to 2008 period, officials wrote, 92 percent of the population served by community water systems received water that had no reported health-based violations.

The Times’s reporting, the statements added, “does not distinguish between significant violations and minor violations,” and “as a result, the conclusions may present an unduly alarming picture.” They wrote that “much of the country’s water quality problems are caused by discharges from nonpoint sources of pollution, such as agricultural runoff, which cannot be corrected solely through enforcement.”

Ultimately, lawmakers and environmental activists say, the best solution is for Congress to hold the E.P.A. and states accountable for their failures.

The Clean Water Act, they add, should be expanded to police other types of pollution — like farm and livestock runoff — that are largely unregulated. And they say Congress should give state agencies more resources, in the same way that federal dollars helped overhaul the nation's sewage systems in the 1970s.

Some say changes will not occur without public outrage.

“When we started regulating water pollution in the 1970s, there was a huge public outcry because you could see raw sewage flowing into the rivers,” said William D. Ruckelshaus, who served as the first head of the Environmental Protection Agency under President [Richard M. Nixon](#), and then again under President [Ronald Reagan](#).

“Today the violations are much more subtle — pesticides and chemicals you can't see or smell that are even more dangerous,” he added. “And so a lot of the public pressure on regulatory agencies has ebbed away.”

Karl Russell contributed reporting.